

REMARKS

Status of the Claims

Upon entry of the present amendment, claims 1-10 will remain pending in the above-identified Application and stand ready for further action on the merits.

New matter is not being introduced into the Application by way of this amendment. The subject matter of claim 12 has been incorporated into claim 1, and claims 11, 12 and 13 have been canceled. The amendment to claim 1 is also supported at page 9, lines 20-24 of the Specification.

Accordingly, entry of this amendment is appropriate and respectfully requested.

Amendments to the Specification

Table 2 on page 28 of the Application is currently amended to delete the reference to the "Kind" of inorganic particles used for Example 6 and Comparative Example 5. The type of inorganic particles used in Example 6 and Comparative Example 5 was:

Kind: Colloidal Silica;

Trade Name: Spherica Slurry 120;

Manufacturer: CATALYSTS & CHEMICALS INDUSTRIES CO., LTD.

Average Particle Size (nm): 120

Solid Ingredient (% by wt.): 18.

This type of silica is listed as entry (7) in Table I of the attached **Declaration** by Yasuhiro YONEDA.

Accordingly, no new matter is being introduced into the Application by way of this amendment and entry is respectfully submitted.

Examiner Interview

The Applicants would like to thank the Examiner for the Interview held on December 13, 2005. At the Interview, the Applicants stressed to the Examiner that all of the working Examples of the '501 reference utilize only fumed silica. In addition, the criticality of the presently claimed size range was discussed. The Examiner agreed that, since the size range recited in the prior art is extremely broad, a showing of criticality of the comparatively narrow size ranges presently claimed, could overcome the prior art rejections.

Claim Rejections – 35 U.S.C. §103

At page 2 of the Office Action, claims 1-10 and 11-13 are rejected under 35 U.S.C. §103(a) as unpatentable over EP 1020501 (EP '501) alone, or in view of Liu (U.S. 6,299,795) and/or Ina (U.S. 6,315,803), for the reasons given in the Office Action of April 11, 2005. With regard to claims 11-13, the Examiner also asserts that EP '501 discloses in section [0055] sizes for inorganic particles that encompass the claimed sizes.

At page 2 of the Office Action, claims 1-10 and 11-13 are rejected under 35 U.S.C. §103(a) as unpatentable over EP 1036836 (EP '836) alone, or in view of Liu (U.S. 6,299,795) and/or Ina (U.S. 6,315,803), for the reasons given in the Office Action of April 11, 2005. With regards to claims 11-13, the Examiner asserts that EP '836 discloses in section [0061] sizes for the inorganic particles that encompass the claimed sizes.

For the reasons given below, each of these rejections is respectfully traversed.

1. The Yoneda Declaration

Claim 1 is currently amended to recite a particle size range for the inorganic particles of from 20 to 130 nm. As discussed at the interview held on December 13, 2005, the prior art only mentions an extremely broad size range for the inorganic particles of 0.01 μm to 1.0 μm . Also, the prior art does not disclose any working Examples of polishing compositions with inorganic particles that utilize colloidal silica, or silica in the colloidal silica size range. All of the prior art working examples utilize silica which is of a comparatively large particle size. At the Interview, the Examiner agreed that a showing of criticality, or unexpected results, for the presently claimed silica particle size range could overcome the prior art rejections.

The inventors have therefore conducted the follow-up tests as shown in the attached **Declaration**, by Yasuhiro YONEDA. In the YONEDA Declaration, it is shown that:

- 1) there is the surprising and remarkable result that the polishing rate is remarkably increased when the colloidal silica, especially a colloidal silica having a particle size of from 20-130 nm, and the polymer particles are used in combination, as compared to the case where these components are not used in combination;
- 2) a similar effect of an increase in the polishing rate is not found when fumed silica and polymer particles are used in combination, as compared to the case where these components are not used in combination; and
- 3) a surprising and unexpected result that dispersibility of a polishing composition containing colloidal silica is more stable than one containing fumed silica.

2. EP '501

EP '501 discloses a combined use of inorganic particles having a very wide particle size range of greater than $0.01\ \mu\text{m}$ and less than $5\ \mu\text{m}$, and polymer particles (see [0055] of EP'501). However EP '501 does not disclose or suggest the possibility that an increase in the polishing rate can be obtained when going from using fumed silica to using colloidal silica.

As shown by the YONEDA Declaration, a polishing composition containing fumed silica having a fine particle size of 170 nm, does not exhibit a remarkably increased polishing rate. See YONEDA Declaration, page 7, Figure A. Therefore, it is surprising and unexpected over the teachings of EP '501 that a high polishing rate can be achieved when using colloidal silica having an average particle size in the size range of 20-130 nm when used in combination with polymer particles.

3. EP '836

EP'836 also discloses polishing compositions that include inorganic particles with an extremely wide particle size range of $0.01\text{-}1.0\ \mu\text{m}$ (see [0061] of EP'836). EP'836 only discloses fumed silica in the working Examples, and is completely silent with regard to the use of colloidal silica (see [0070] of EP'836). Therefore, it is surprising and completely unexpected over the teachings of EP'836 that a high polishing rate can be achieved when using colloidal silica with an average particle size in the size range of 20-130 nm, when such silica particles are used in combination with polymer particles.

In addition, EP'836 discloses that the ratio of particle sizes (D_p/D_i) of the polymer particles and the inorganic particles is preferably 1-40, and more preferably 2-10 (see [0063]). It

can be seen from Table 3 of the present Application, that the effect of an increase in the polishing rate of Comparative Example 7 ($D_p/D_i = 3.1$) is one half, or less, the polishing rate of Example 2 ($D_p/D_i = 1.5$). Similarly, the polishing rate effects shown in Comparative Example 8 ($D_p/D_i = 2.3$) and Comparative Example 9 ($D_p/D_i = 3.1$) are about one-half that of Example 3 ($D_p/D_i = 1.2$). In Comparative Example 10 ($D_p/D_i = 1.6$), the effect of an increase in the polishing rate is not exhibited, and this Example shows a polishing rate of only one-half, or less, the polishing rate of Example 10 ($D_p/D_i = 0.6$).

One of skill in the art would learn from the disclosure of EP '836 that the D_p/D_i ratios of Comparative Examples 7-10 are preferred over those of the present Examples 2, 3 and 10. Therefore, EP' 836, in fact, teaches away from the present invention. The surprising results obtained by the present invention using silica particles in the presently claimed size range is unexpected from the prior art teachings.

The Applicants respectfully submit that the prior art does not disclose or suggest the polishing compositions that are presently claimed. An early reconsideration and Notice of Allowance are earnestly solicited.

CONCLUSION

Based upon the amendments and remarks presented herein, the Examiner is respectfully requested to issue a Notice of Allowance clearly indicating that each of the pending claims 1-10 are allowable at present.

Should there be any outstanding matters that need to be resolved in the present Application, the Examiner is respectfully requested to contact J. Mark Konieczny (Reg. No.

Application No. 10/668,216
Amendment dated February 28, 2006
After Final Office Action of August 29, 2005

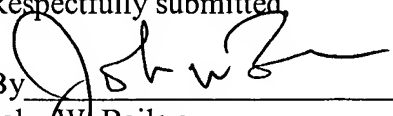
Docket No.: 1422-0603P

47,715) at the telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present Application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: February 28, 2006

Respectfully submitted

By 

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Attachment: 37 CFR § 1.132 Declaration of Yasuhiro YONEDA